What I think I Heard Yesterday

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Option using the NUMI Beamline

- Can get 17 kiloton Liquid Argon Detector on surface at SUDAN with 700 Kwatt beam for around 600 M$
- Mass hierarchy measurement better then 3σ over most of the range except for a hole with 2σ (using T2K results)
- CP measurement with an error on the CP violating phase between 20^o (at $\delta = 0$) and 30^o (at $\delta=-\pi/2$)
- This seems like a worthwhile Phase 1 Option

Homestake Option-Input

- Beam to Homestake-Vaia Papadimitriu Talk
  - 219 M$ for conventional facilities
  - 170 M$ for technical components
  - 62 M$ possible savings(some double counting?)
  - 219+170-50 = 339 2010 M$
- Far Detector Costs-T. Lundin and B. Baller talks
  - Liquid Argon on surface
Kilotons	Conv Fac	Tech Comp	Total
5	49	132	181
17	82	243	325
34	133	350	483
- Can fit this by total cost = 126+11x(no of kt) in 2010M$

Homestake Assumptions

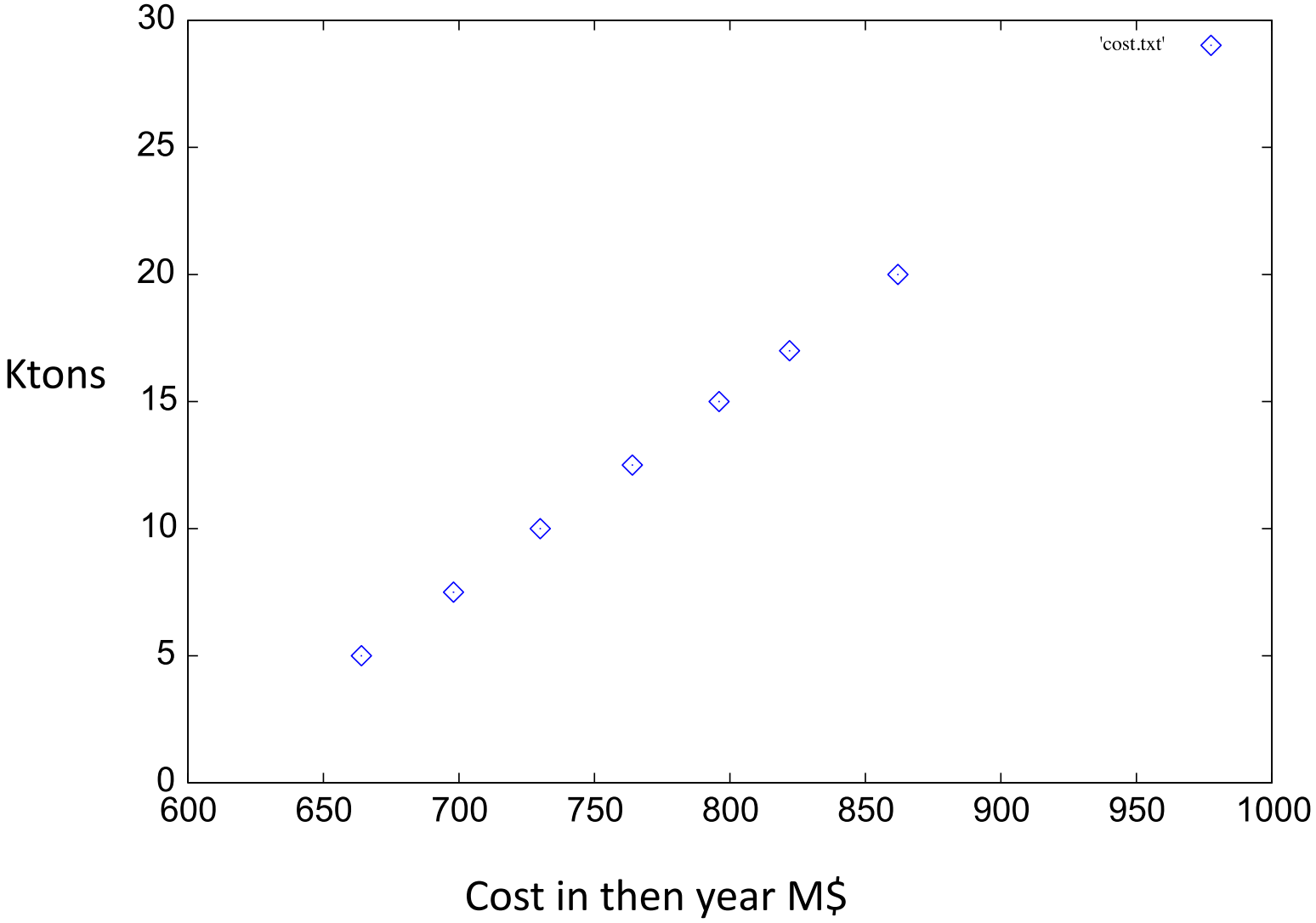
- Escalation
  - Assume 6 year construction 2014 to 2020
  - Escalate 2010$ to 2017$ on average
  - $(1.025)^7 = 1.19$, call it 20%
- Project Office
  - Add 40 M$ (2017 $) for Project Management
- Errors on CP violating phase from plot of (1 sigma error in degrees) vs.(kiloton years) for Homestake from Mary Bishai and Sam Zeller talk
- No Near Detector

Homestake Costs and Reach

Kilotons	Beam	Detector	Proj Offi	Total	Escalated	CP Error δ =0	CP Error δ=-90
5	339	181	33	553	664	23	42
10	339	236	33	608	730	17	30
17	339	325	33	697	836	13	23

With 10 kilotons can get better then 3σ mass hierarchy measurement at all values of δ

Cost of Homestake Options



CP Reach of Homestake Option